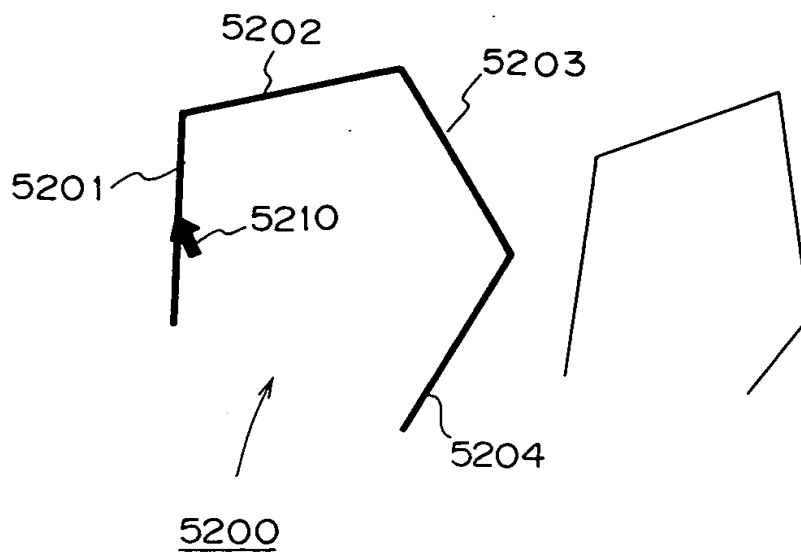


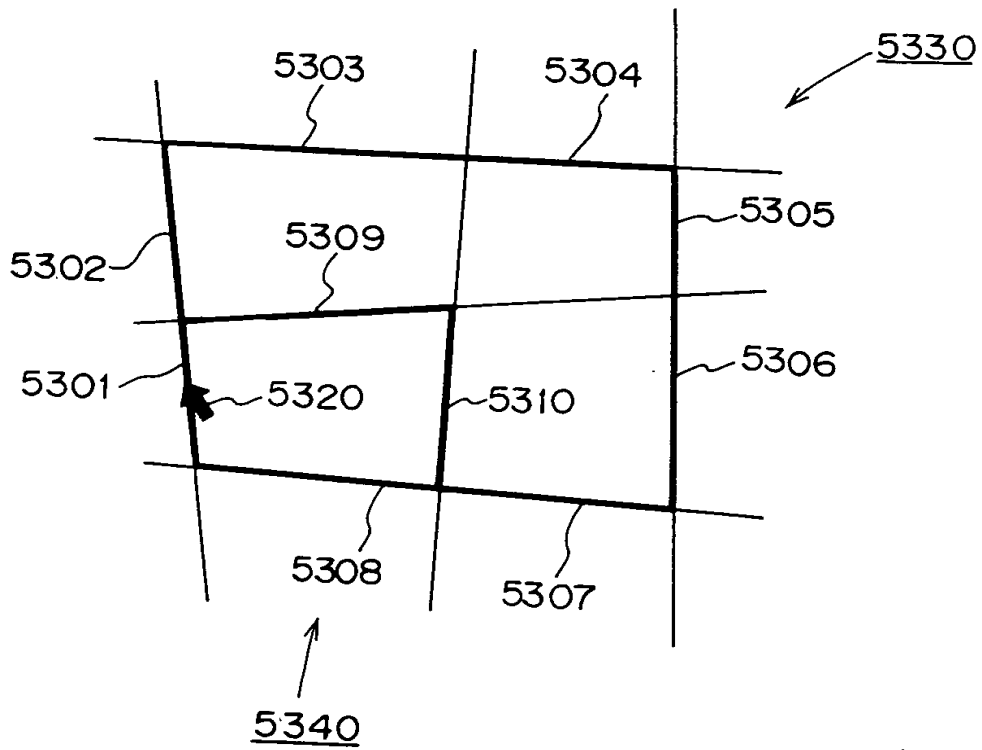
PRIOR ART

FIG. 1



PRIOR ART

FIG. 2



PRIOR ART

FIG. 3

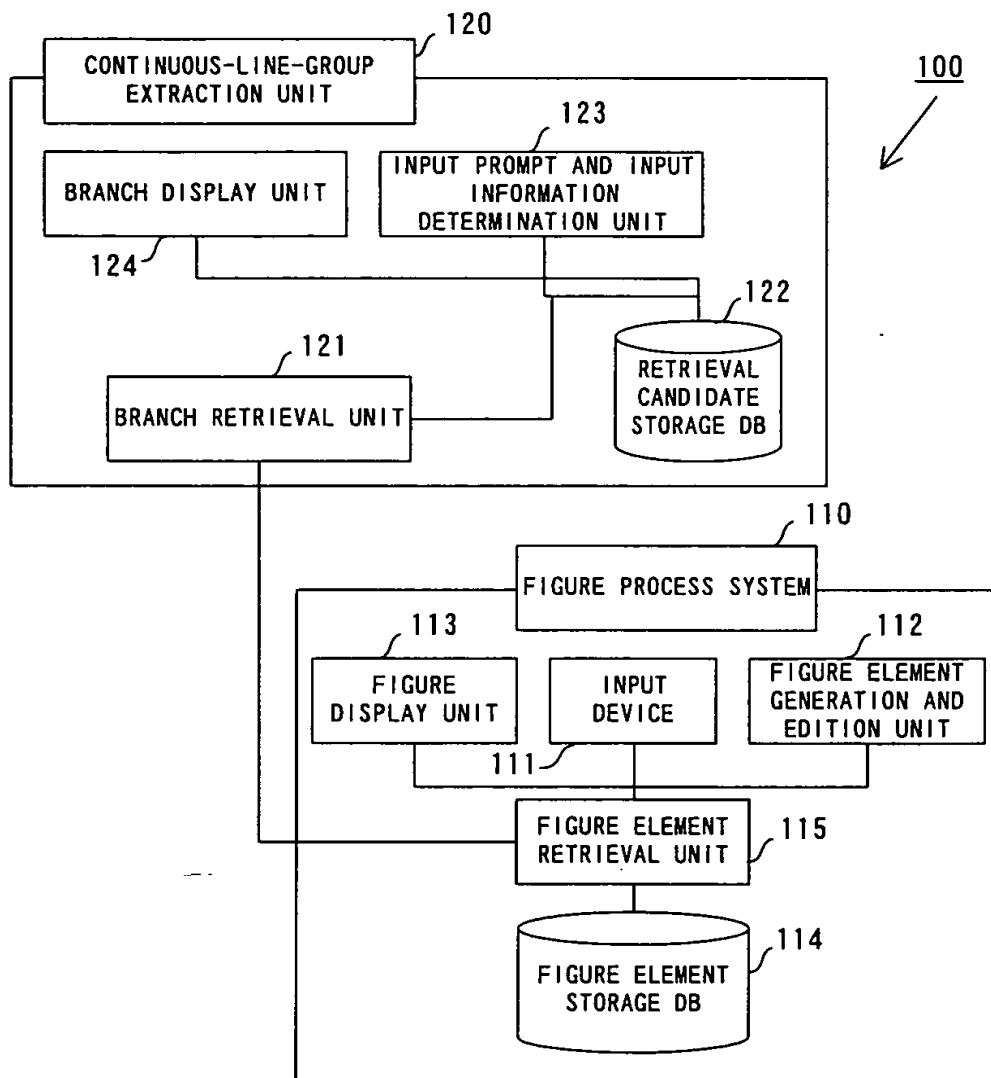


FIG. 4

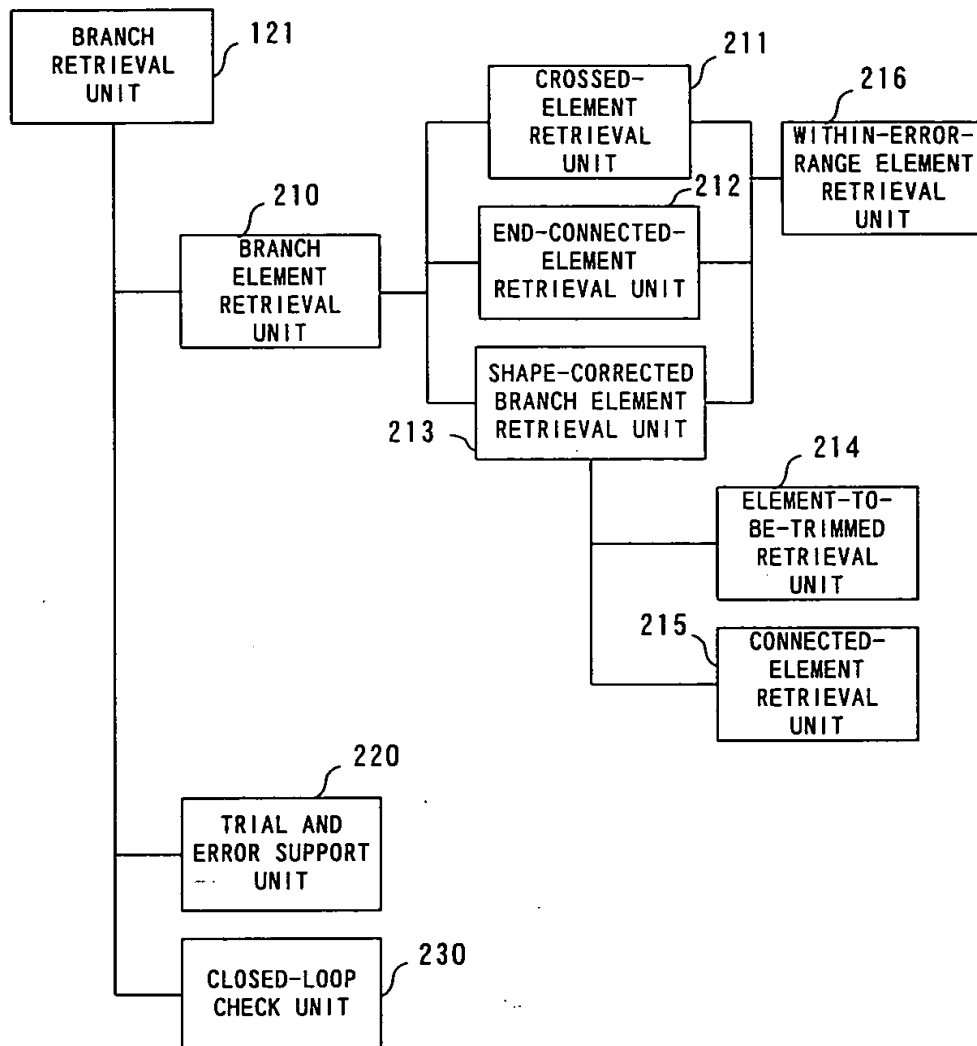


FIG. 5

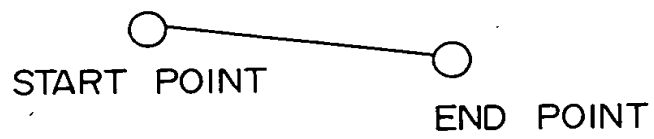


FIG. 6

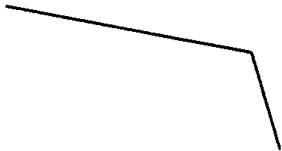
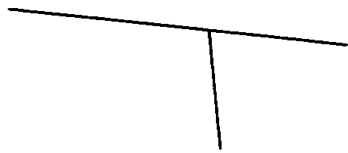
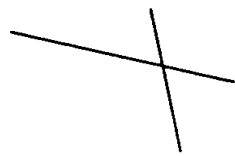


FIGURE ELEMENTS ARE
CONNECTED AT THE ENDS
IN THE CASE WHERE
INTERSECTION IS AT THE
ENDS OF THE RESPECTIVE
ELEMENTS, UNDER THE
END-CONNECTED STATE AS
SHOWN IN FIG. 8

FIG. 7



(a)



(b)

FIGURE ELEMENTS WITH
AN INTERSECTION

FIG. 8



FIGURE ELEMENTS WITH
TWO INTERSECTIONS

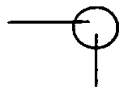
FIG. 9

- (a) _____ FIGURE ELEMENTS WHICH ARE
ON THE SAME STRAIGHT LINE
(CURVED LINE) AND DO NOT
CROSS
- (b) _____ FIGURE ELEMENTS THAT INTERSECT
WHEN EXTENDED

FIG. 10



(a)



(b)

○ : SIZE OF A PREDETERMINED
ERROR, FOR EXAMPLE, ABOUT
 10^{-3}

FIG. 11

NUMBER OF REGISTERED ELEMENTS = N	
1	FIGURE ELEMENT ID
2	FIGURE ELEMENT ID
3	FIGURE ELEMENT ID
	⋮
N	FIGURE ELEMENT ID

TABLE 1

F I G. 1 2

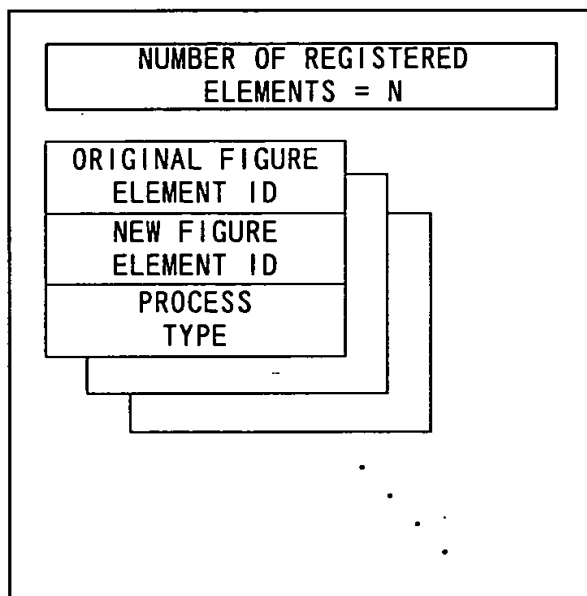


TABLE 2

FIG. 13

FIGURE ELEMENT ID
REFERENCE POINT COORDINATE VALUE

TABLE 3

F I G. 1 4

DIRECTION (POSITIVE/NEGATIVE)

TABLE 4

F I G. 1 5

NUMBER OF CROSSED ELEMENTS = N	
1	CROSSED FIGURE ELEMENT ID
2	CROSSED FIGURE ELEMENT ID
3	CROSSED FIGURE ELEMENT ID
	.
	.
	.
N	CROSSED FIGURE ELEMENT ID

TABLE 5

FIG. 16

CROSSED FIGURE ELEMENT ID	
CROSSED COORDI-	NATE VALUE
DISTANCE FROM REFERENCE POINT	

TABLE 6

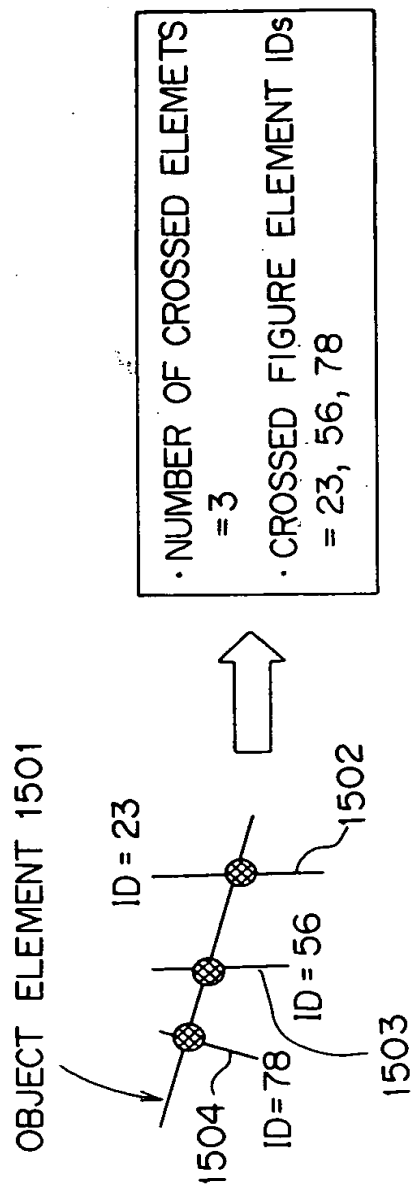
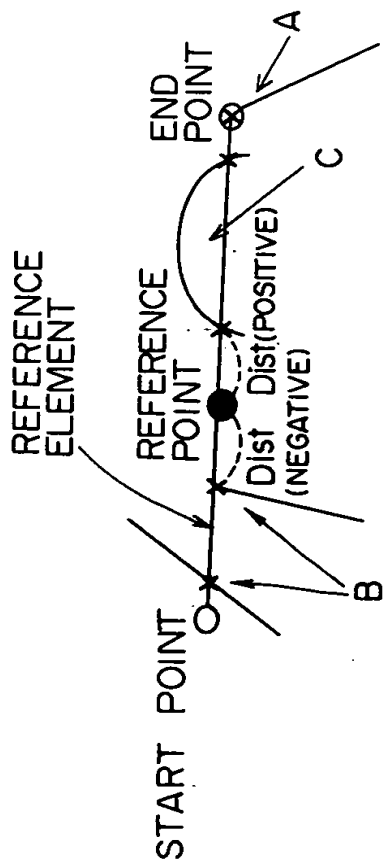


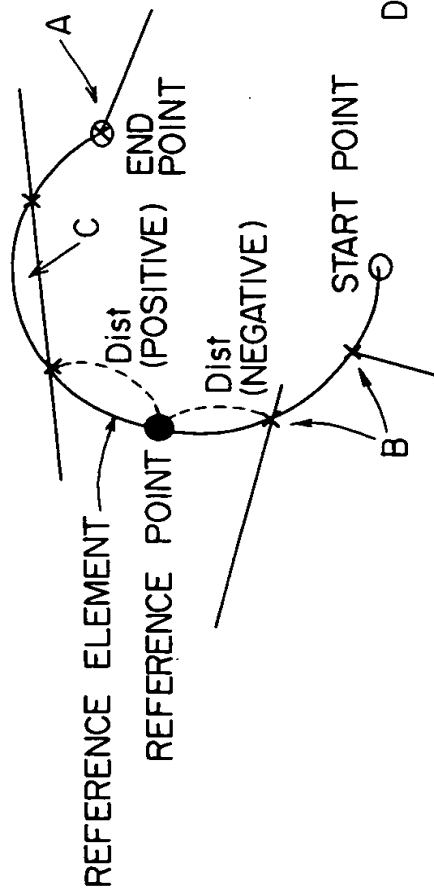
FIG. 18



A : END-CONNECTED STATE
 B : CROSSED STATE
 C : ROOT STATE

Dist : DISTANCE BETWEEN REFERENCE
 POINT AND BRANCH POINT
 (INTERSECTION) : DIRECTION FROM
 REFERENCE POINT TO START SIDE
 IS NEGATIVE DIRECTION AND
 DIRECTION FROM REFERENCE
 POINT TO END SIDE IS POSITIVE
 DIRECTION

FIG. 20



A: END-CONNECTED STATE
 B: CROSSED STATE
 C: ROOT STATE

Dist: RELATIVE ANGLE FROM REFERENCE POINT
 TO BRANCH POINT (INTERSECTION);
 ANGLE FROM REFERENCE POINT TO START
 POINT SIDE (CLOCKWISE) IS NEGATIVE,
 AND ANGLE FROM REFERENCE POINT TO
 END POINT SIDE (COUNTERCLOCKWISE) IS
 POSITIVE

FIG. 21

GENERATION	
NUMBER OF BRANCHES = N	
1	BRANCH ID
2	BRANCH ID
3	BRANCH ID
.	
.	
.	
N	BRANCH ID

TABLE 7

FIG. 22

1. The first step is to identify the original figure element ID.

BRANCH ID			
NUMBER OF ARRANGEMENT FIGURE ELEMENTS			
HEAD FIGURE ELEMENT ID			
<table><tr><td>ORIGINAL FIGURE ELEMENT ID</td></tr><tr><td>INTERSECTION COORDINATE FIGURE</td></tr><tr><td>NEW FIGURE ELEMENT ID</td></tr></table>	ORIGINAL FIGURE ELEMENT ID	INTERSECTION COORDINATE FIGURE	NEW FIGURE ELEMENT ID
ORIGINAL FIGURE ELEMENT ID			
INTERSECTION COORDINATE FIGURE			
NEW FIGURE ELEMENT ID			

TABLE 8

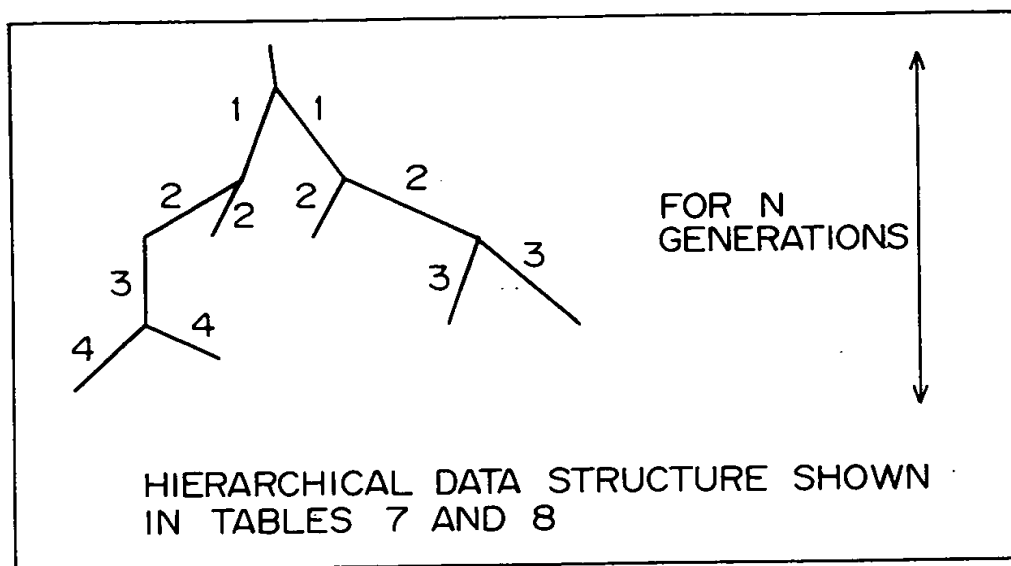


FIG. 24

HEAD END-CONNECTED FIGURE ELEMENT ID	
NUMBER OF END-CONNECTED BRANCHES = N	
1	BRANCH ID
2	BRANCH ID
3	BRANCH ID
.	
.	
.	
.	
N	BRANCH ID

TABLE 9

FIG. 25

FIG. 27 is a schematic diagram of a data structure for a figure element. The structure is a table with three columns and three rows. The columns are labeled 'FIGURE ELEMENT ID', 'PROCESS TYPE', and 'NEW FIGURE ELEMENT ID'. The rows are labeled 'REFERENCE ELEMENT', 'NUMBER OF CANDIDATES FOR FIGURE ELEMENTS', and 'FIGURE ELEMENT ID'. The table is shown with a perspective view, indicating it is a 3D structure.

REFERENCE ELEMENT		
NUMBER OF CANDIDATES FOR FIGURE ELEMENTS		
	FIGURE ELEMENT ID	
	PROCESS TYPE	
	NEW FIGURE ELEMENT ID	

TABLE 11

FIG. 27

NUMBER OF PROCESS TYPES

PROCESS TYPES

NUMBER OF NOT-RETRIEVED FIGURE
ELEMENTS

ORIGINAL FIGURE
ELEMENT ID

NEW FIGURE ELEMENT
ID

TABLE 12

F I G. 28

NUMBER OF SPECIFIED TYPES = N	
	SPECIFIED RETRIEVAL TYPE
	SPECIFIED RETRIEVAL TYPE
	•
	•
	•
	SPECIFIED RETRIEVAL TYPE

TABLE 13

F I G. 29

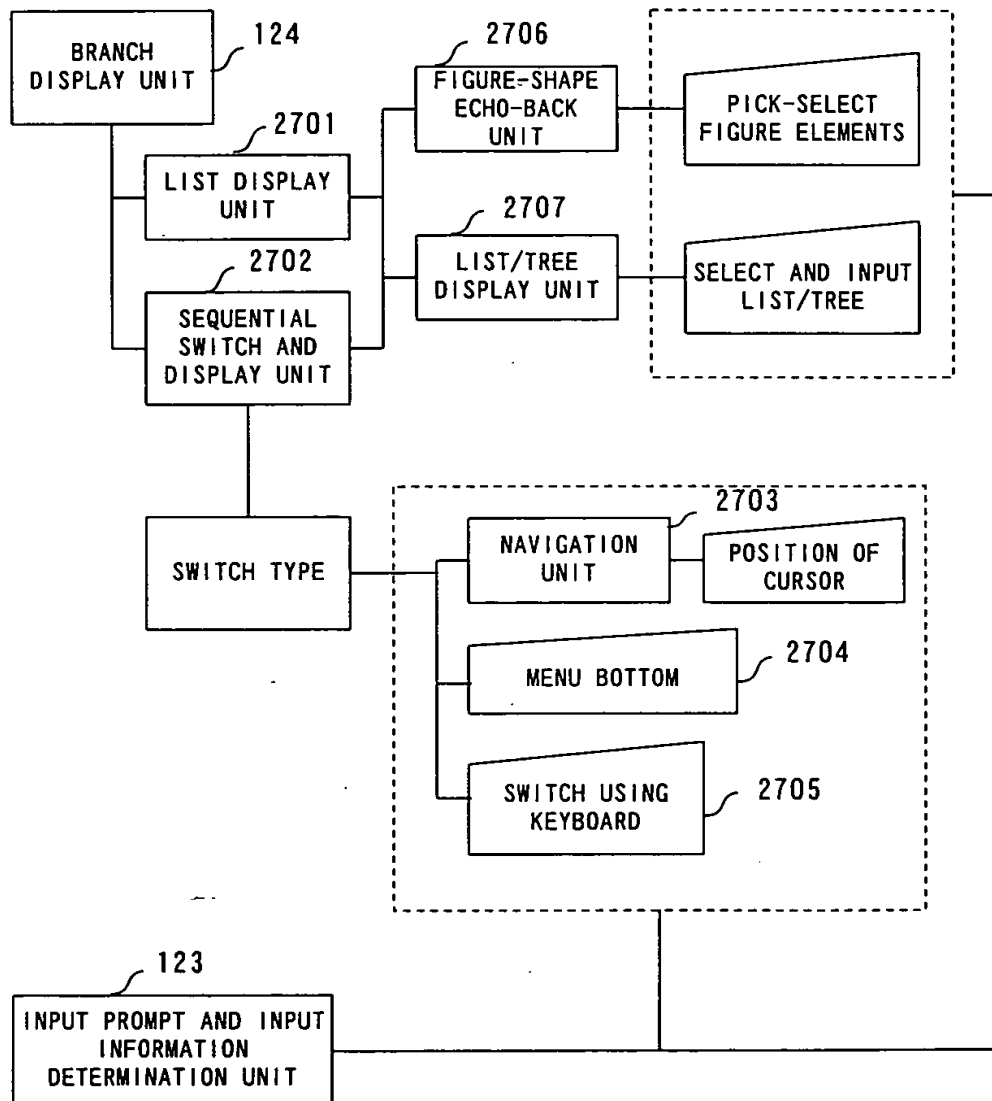


FIG. 30

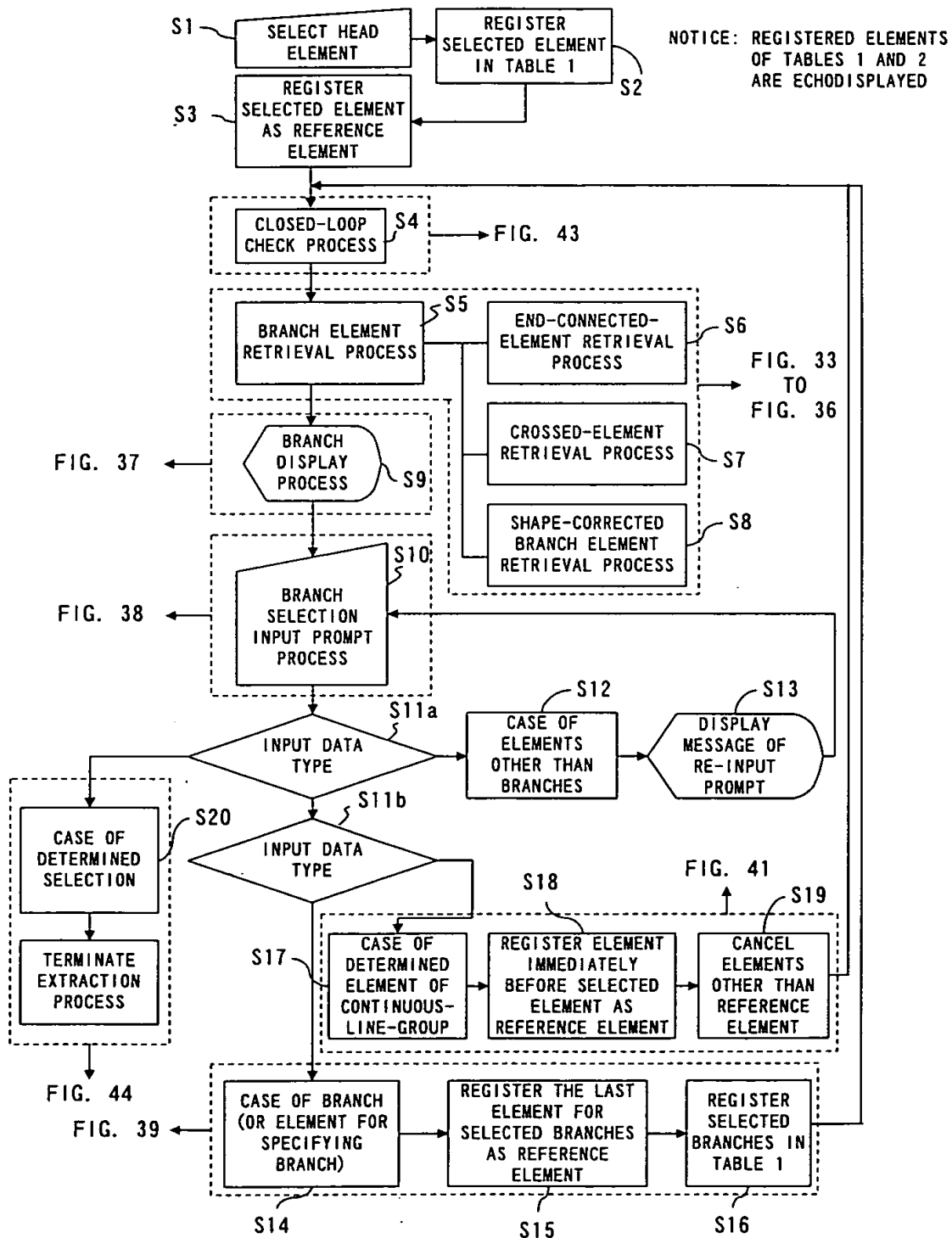


FIG. 31

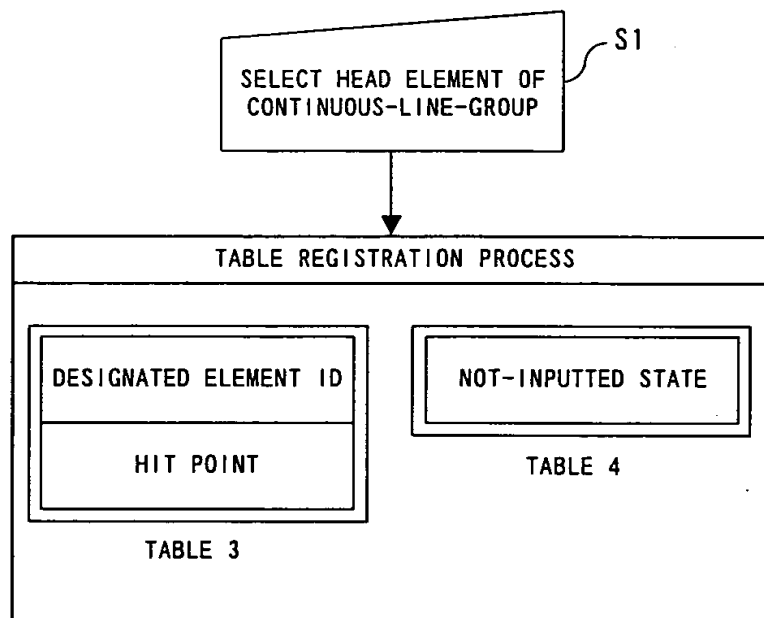


FIG. 32

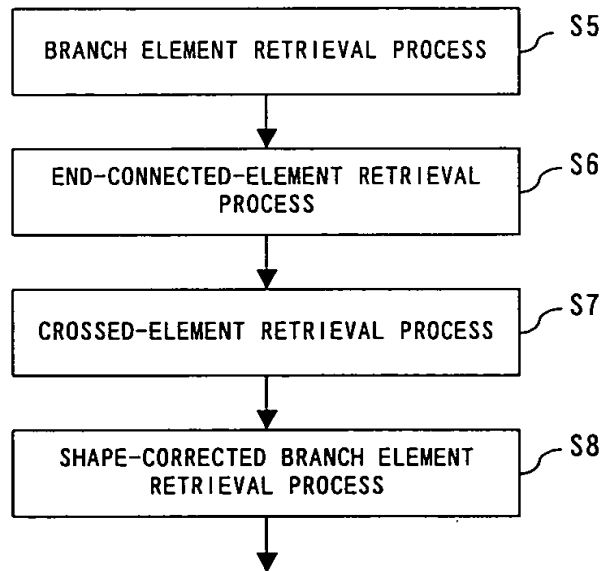


FIG. 33

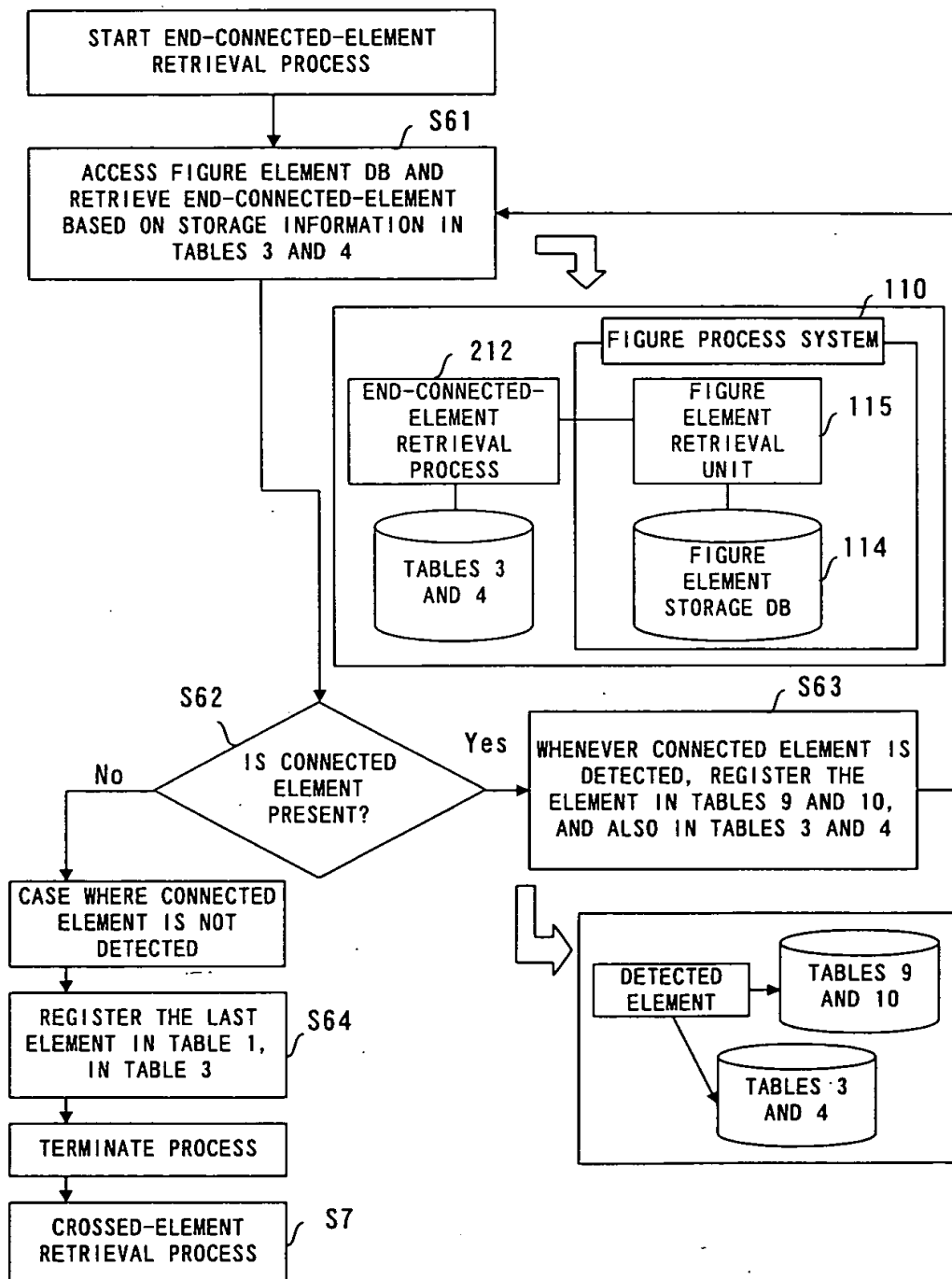


FIG. 34

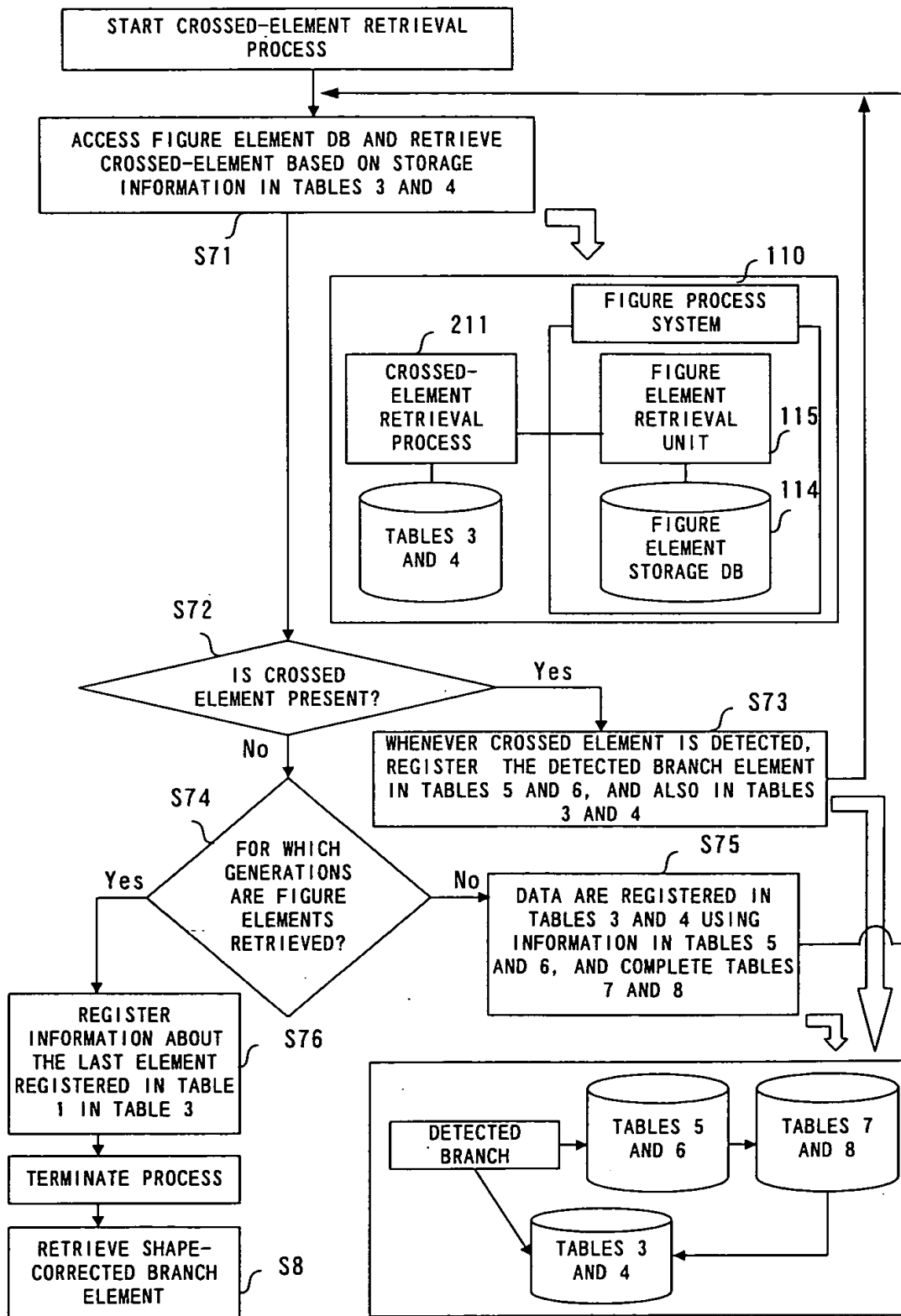


FIG. 35

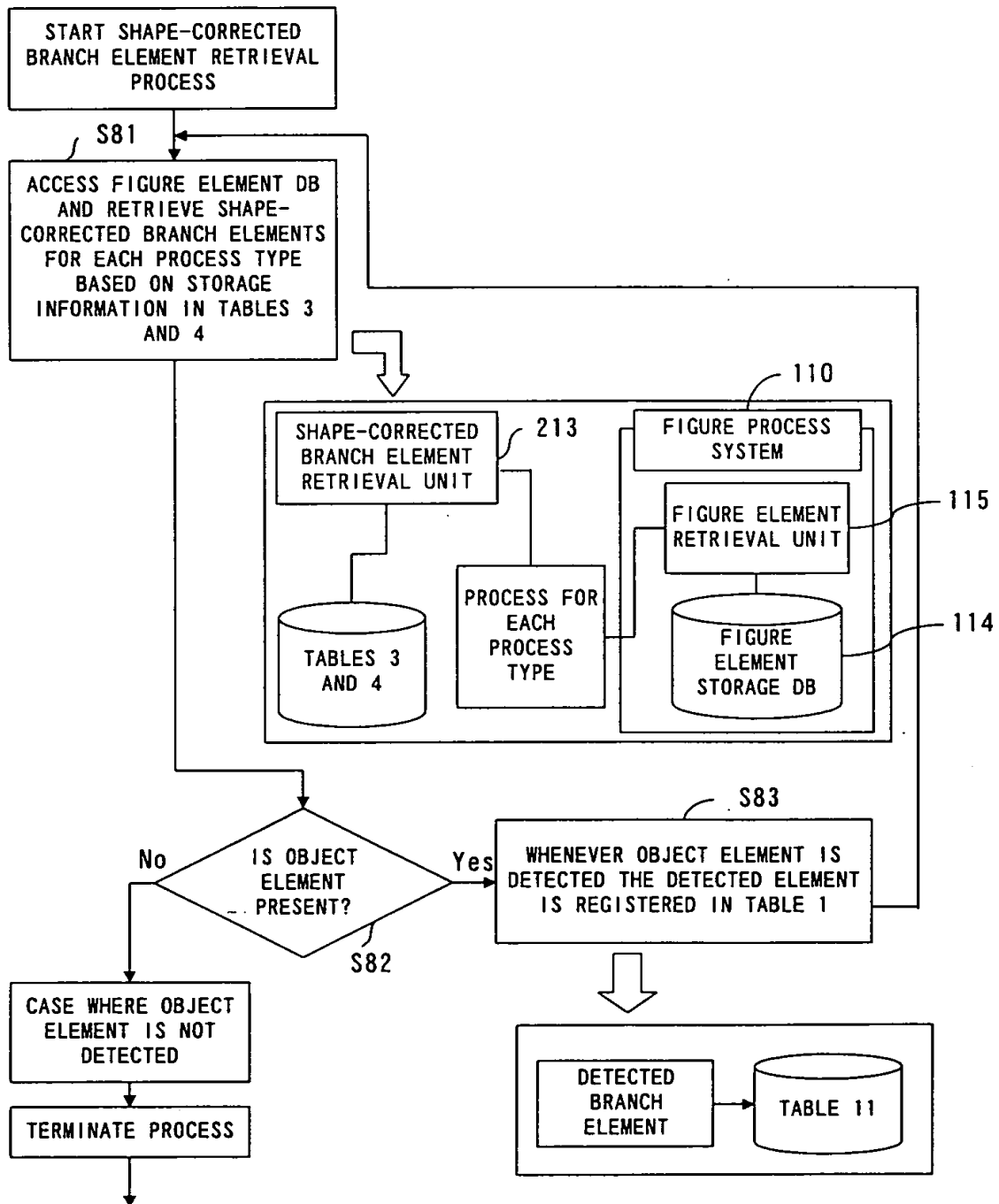
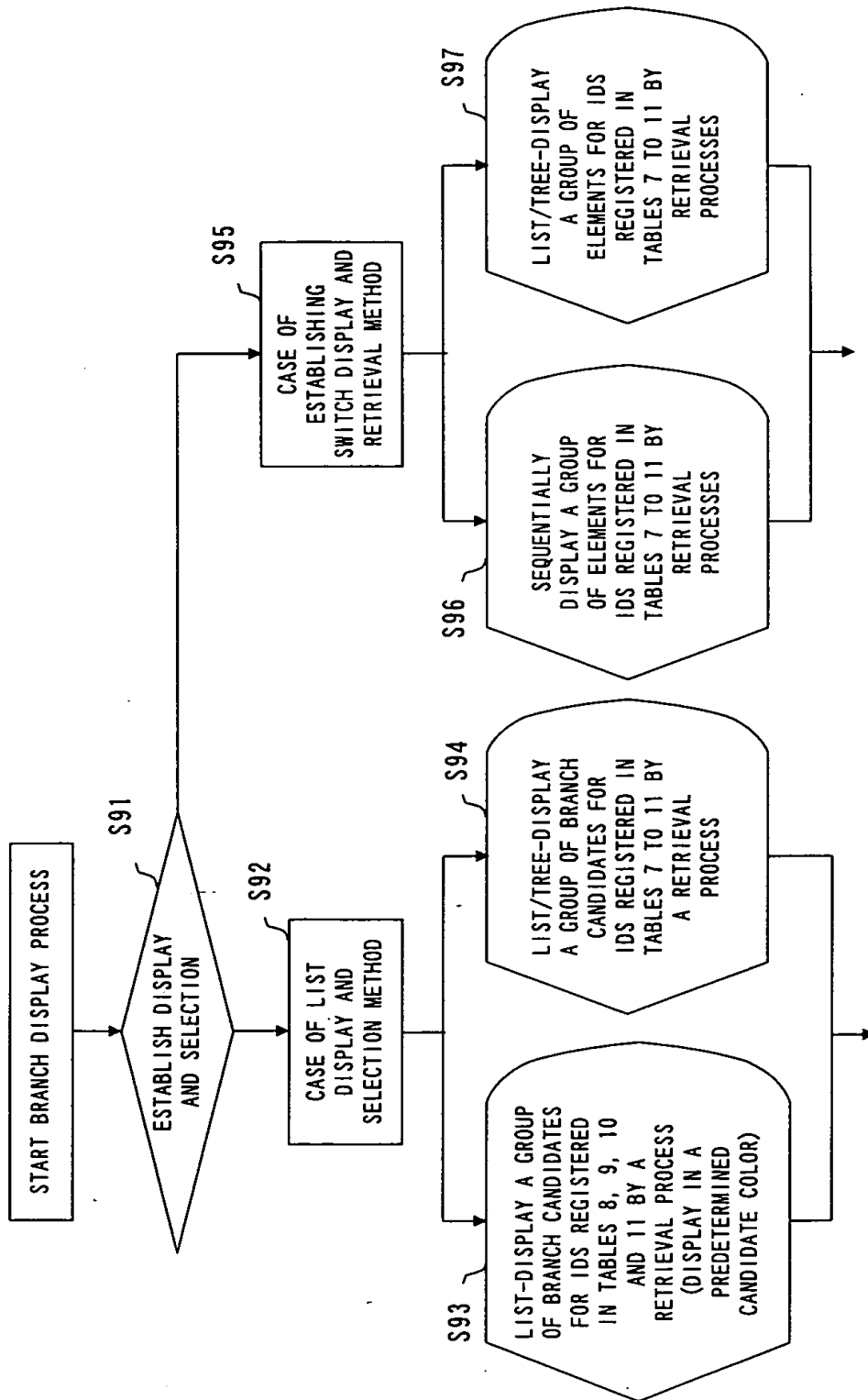


FIG. 36



F I G. 37

PROCESS WILL BE IN A STATE OF WAITING FOR:
(1) PICK-INPUT ON FIGURE DISPLAY SCREEN (SELECTING A FIGURE ELEMENT);
(2) LIST-SELECTION-INPUT (BRANCH ID);
(3) KEYBOARD-INPUT

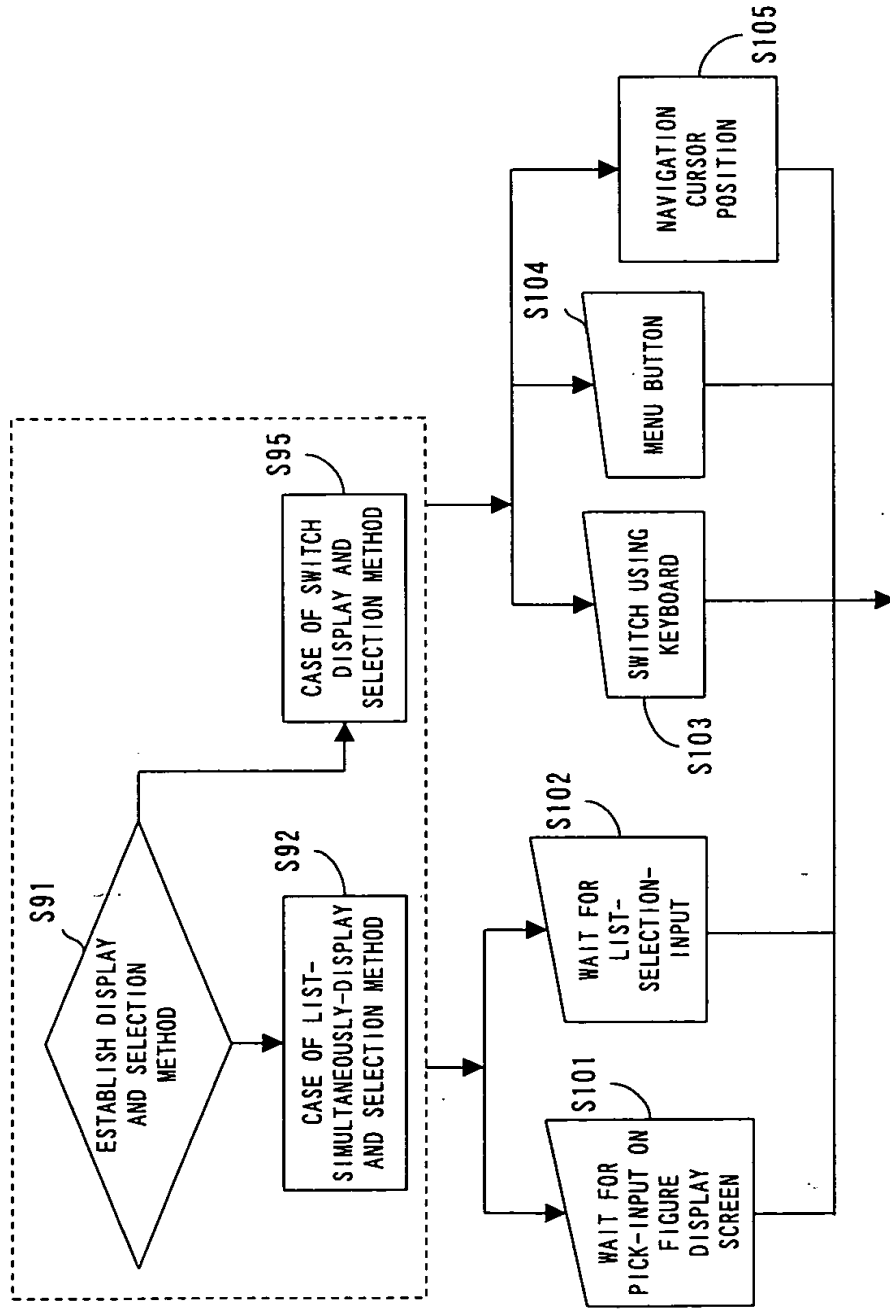


FIG. 38

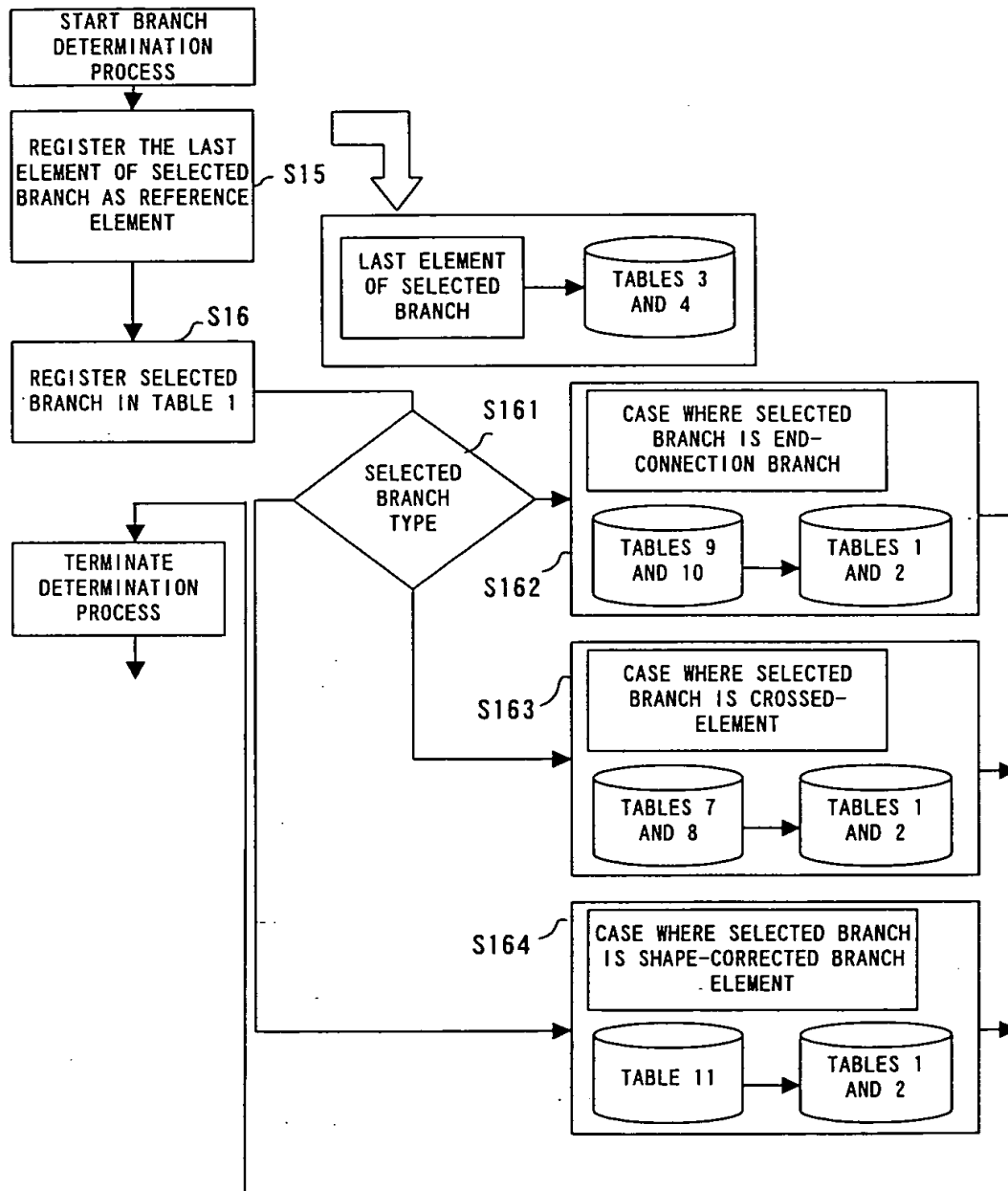


FIG. 39

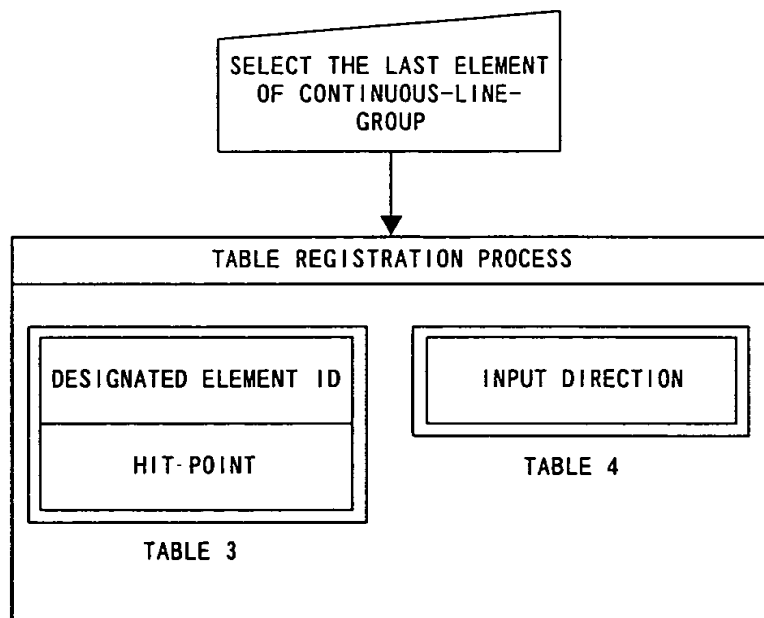


FIG. 40

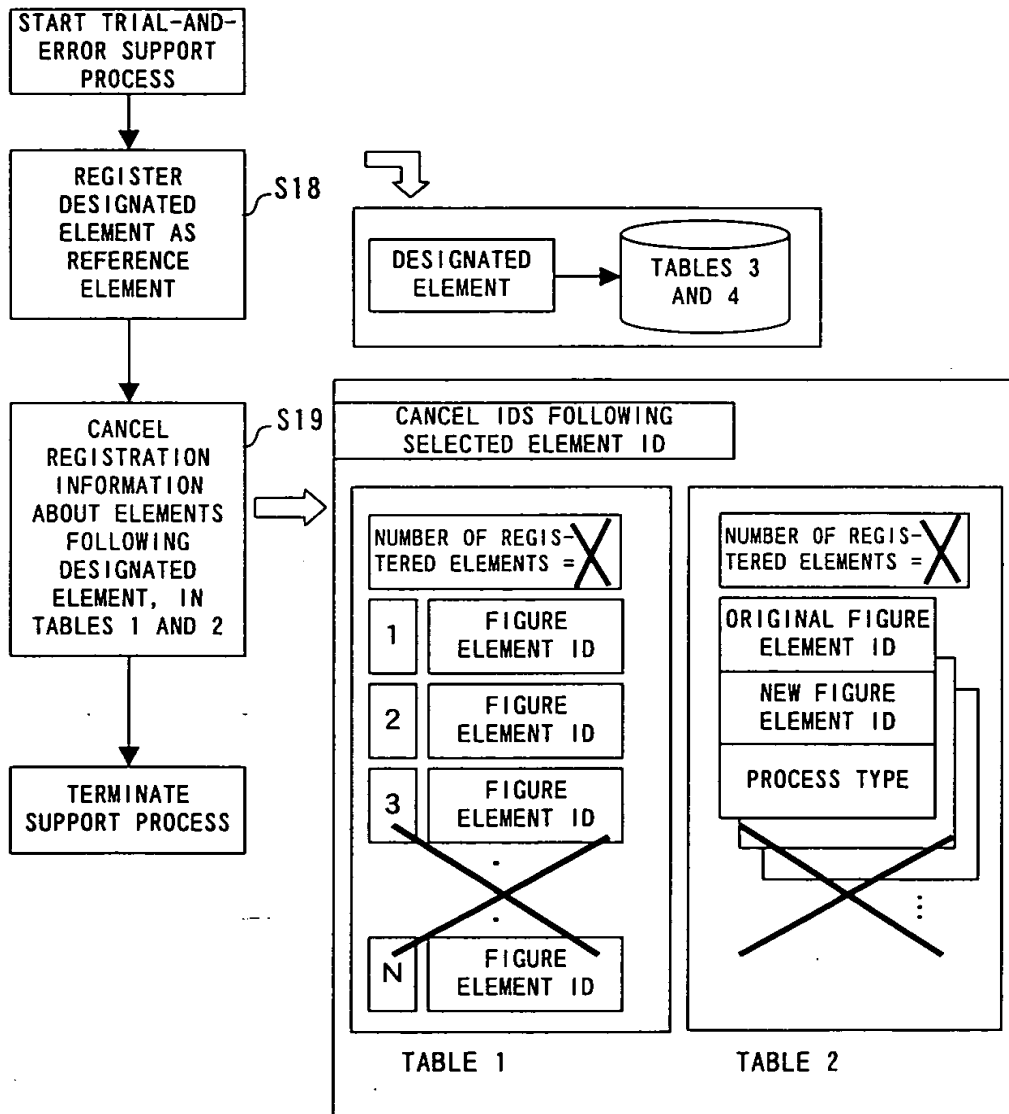


FIG. 41

SELECT ELEMENT
IMMEDIATELY BEFORE
CONTINUOUS-LINE-GROUP

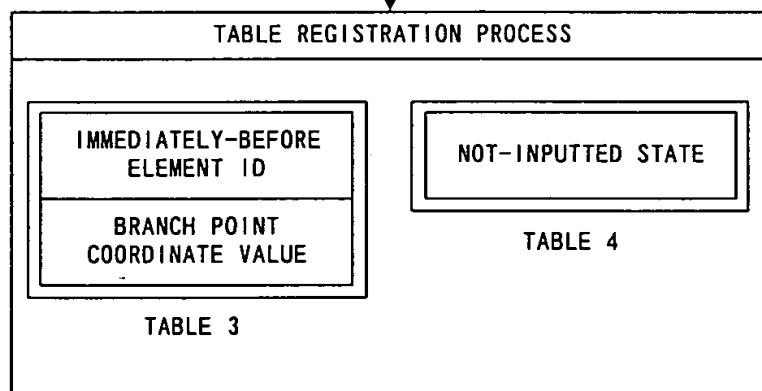


FIG. 42

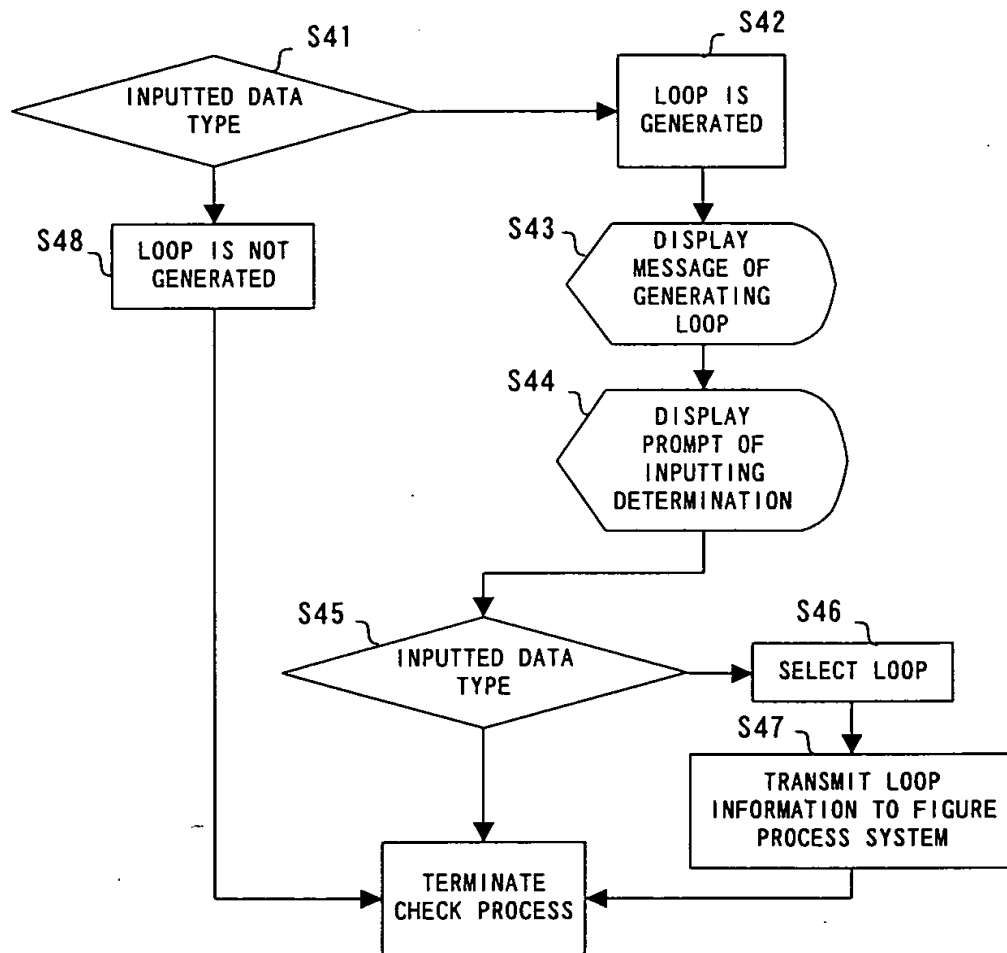


FIG. 43

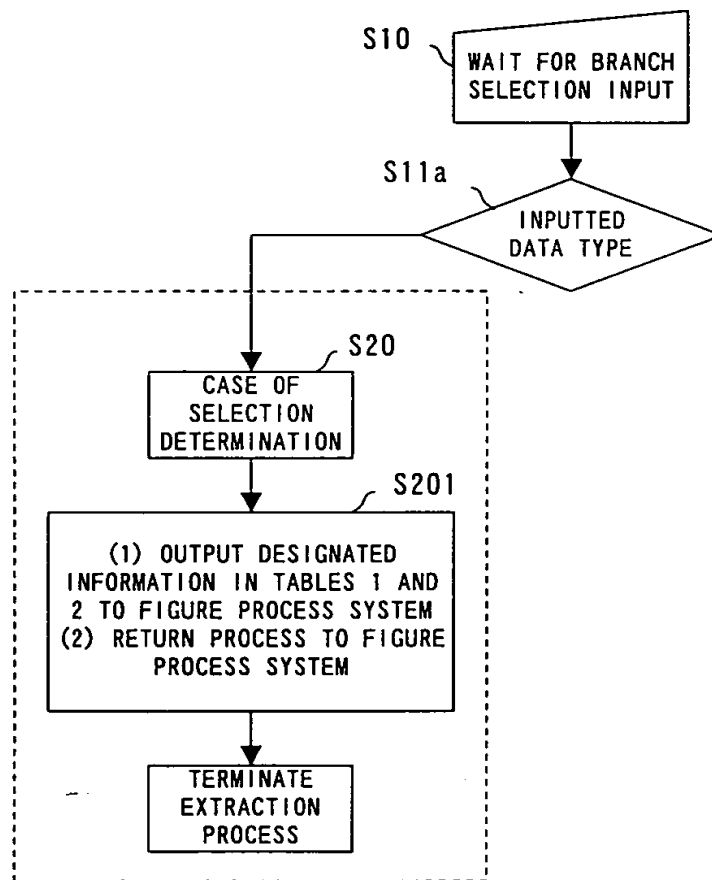


FIG. 44

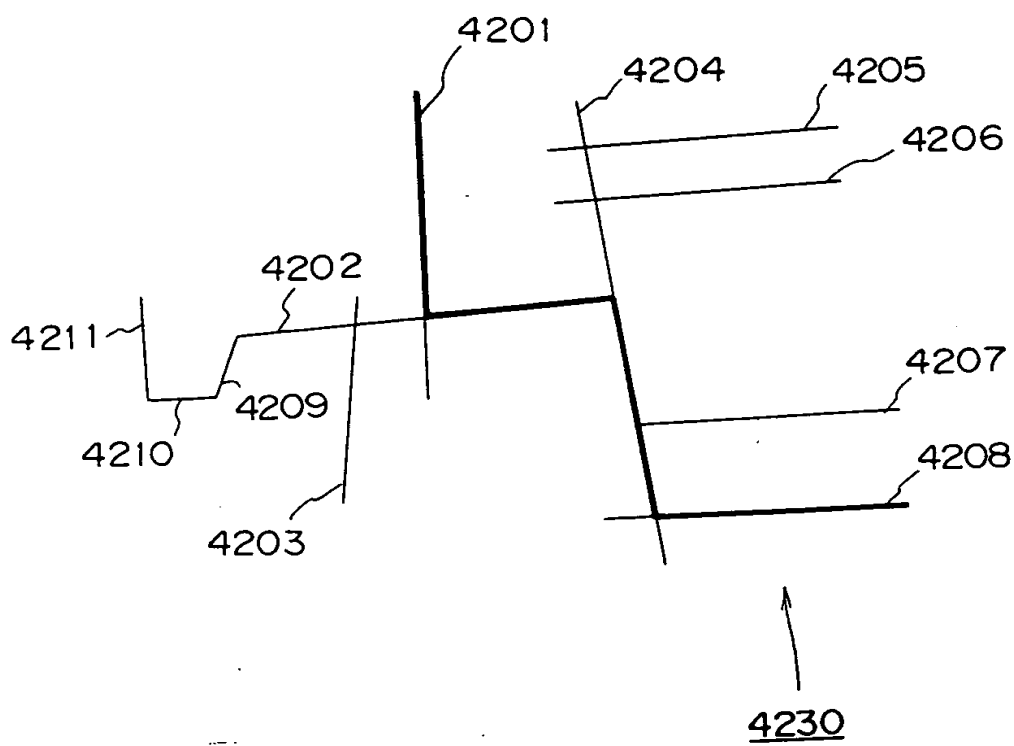


FIG. 45

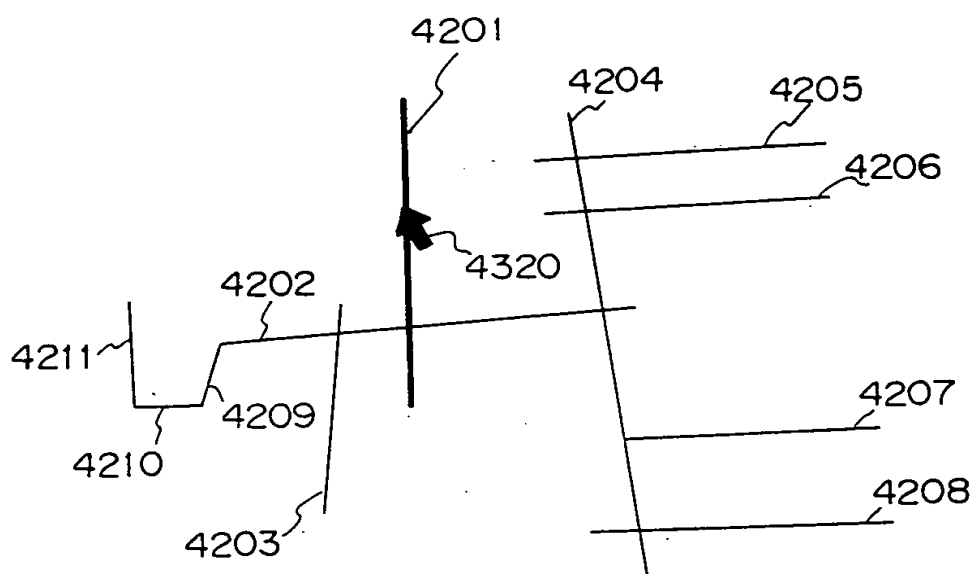


FIG. 46

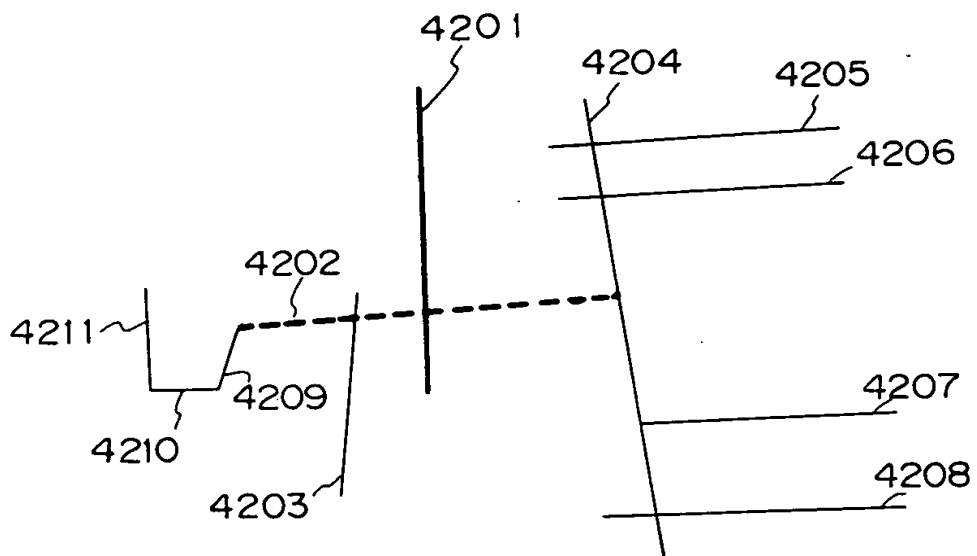


FIG. 47

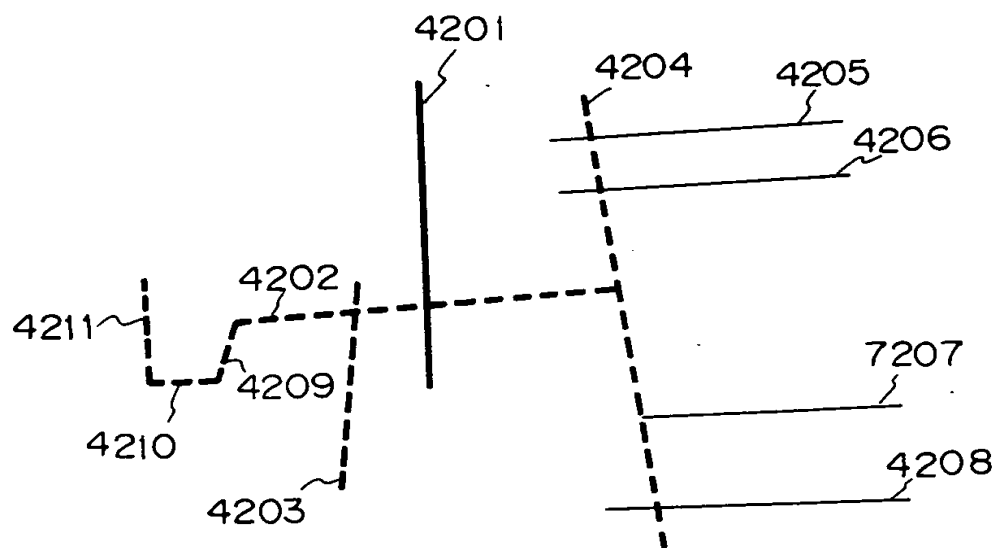


FIG. 48

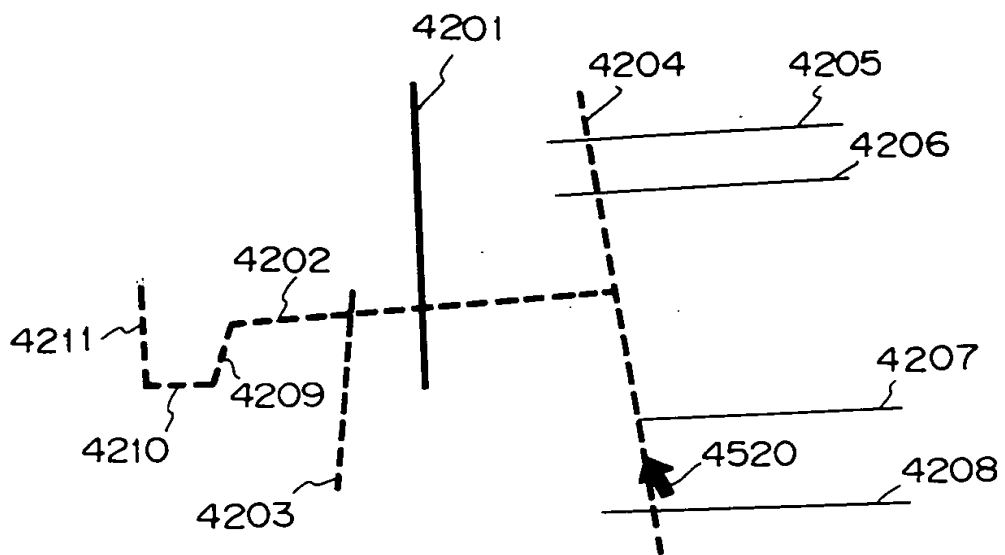


FIG. 49

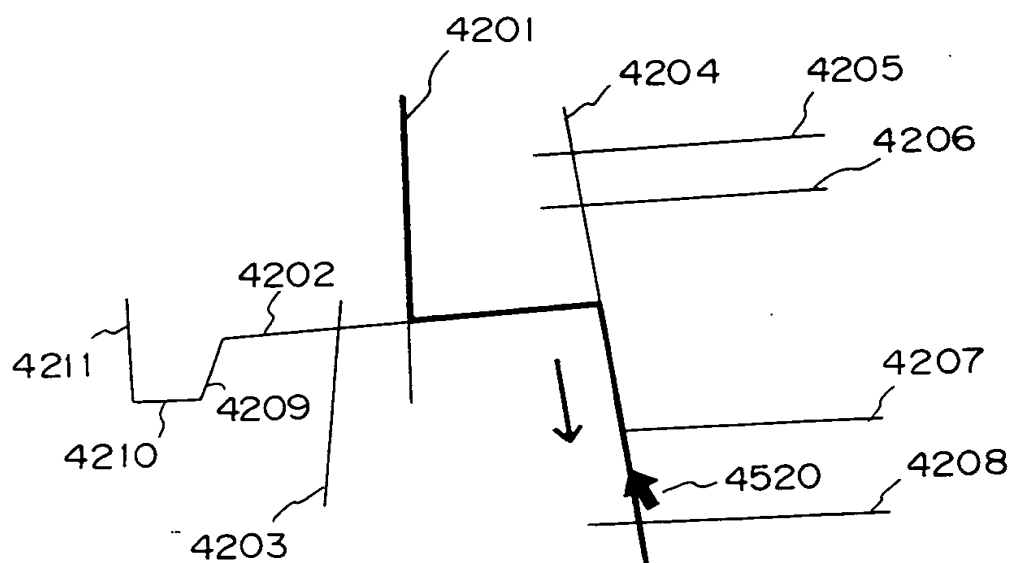


FIG. 50

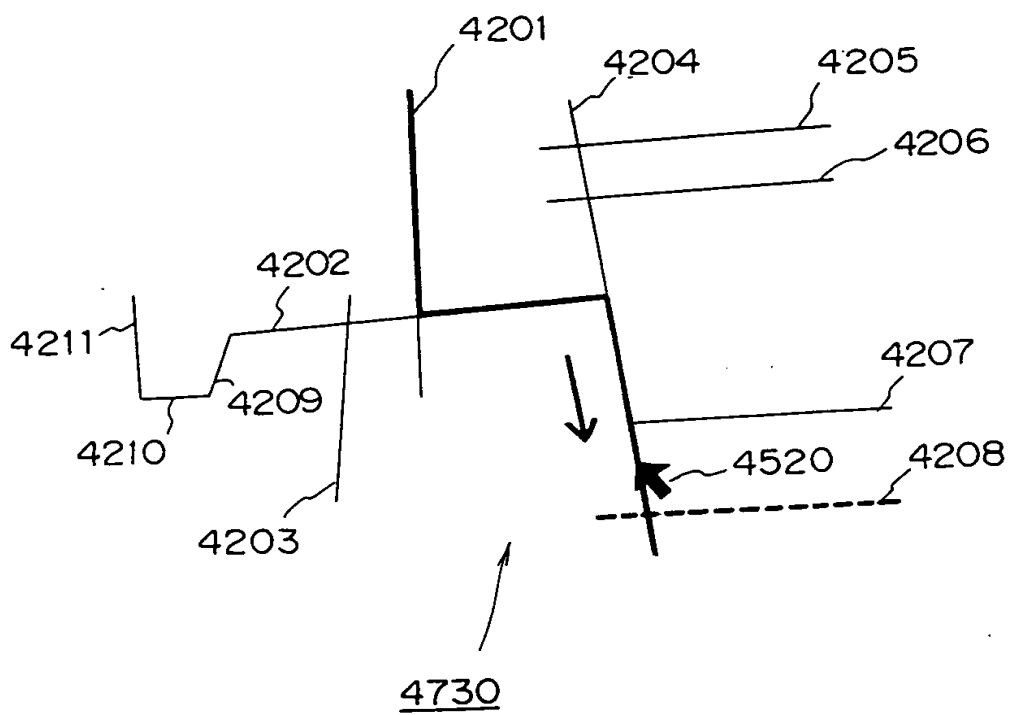


FIG. 51

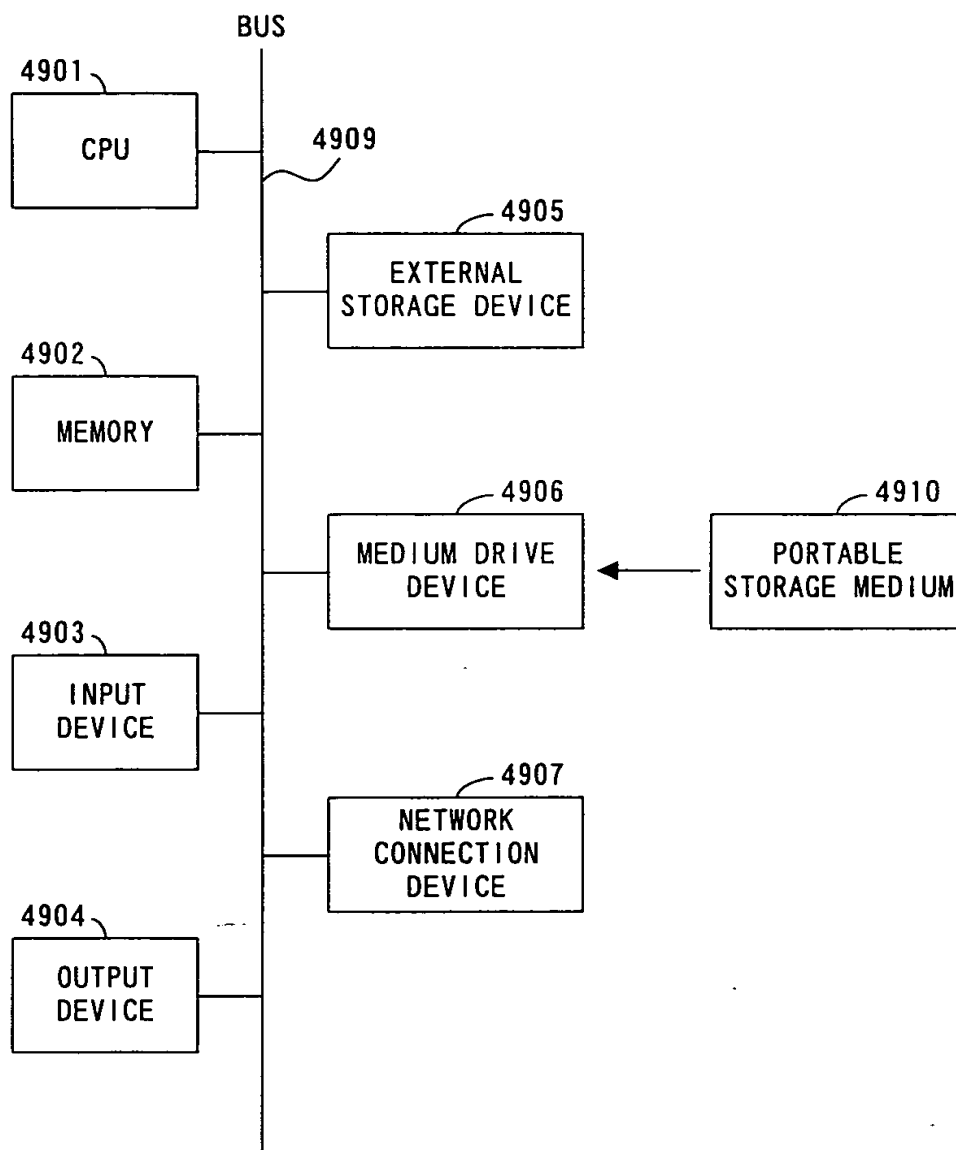


FIG. 52

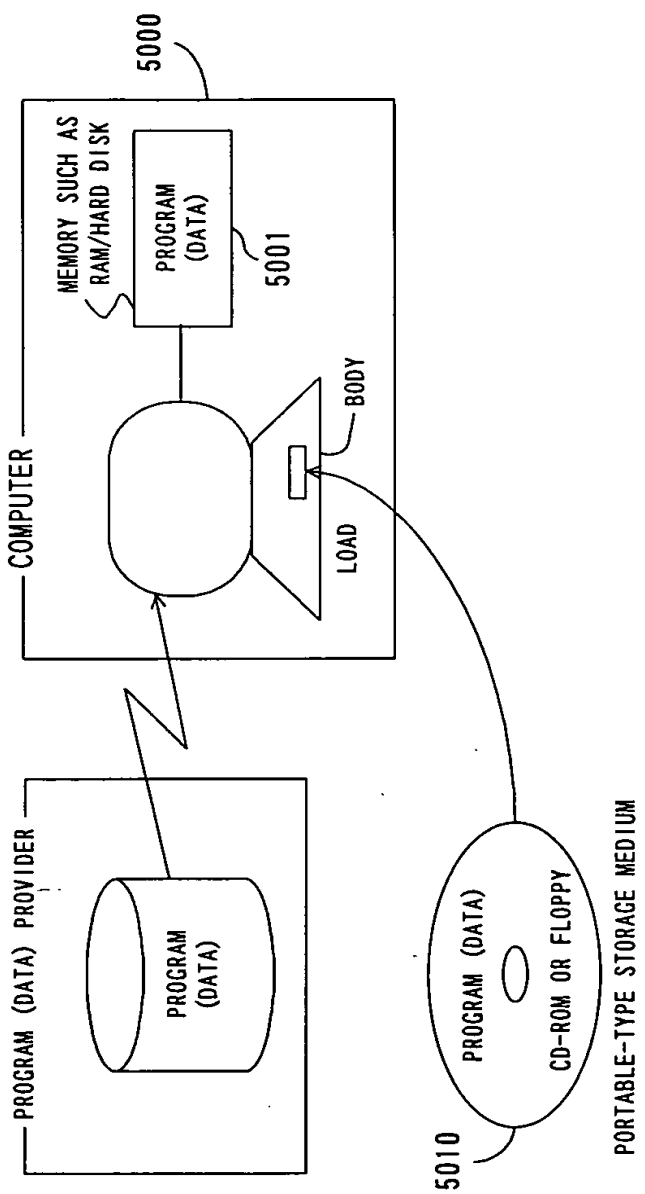


FIG. 53